

### Answers to Practice Problem Set for Calculating time to Pump Out a Tank

1. First calculate the volume of the tank and convert to gallons.

$$\begin{aligned}\text{Volume} &= 100 \text{ ft} \times 45 \text{ ft} \times 27 \text{ ft} = 121,500 \text{ ft}^3 \\ &= 121,500 \text{ ft}^3 \times 7.48\end{aligned}$$

$$= 908,820 \text{ gallons}$$

Divide the pump rate by the number of gallons to find the time. Convert to hours.

$$= \frac{908,820 \text{ gal}}{(600 \times .88) \text{ gal/min}}$$

$$= \frac{908,820 \text{ gal}}{528 \text{ gal/min}}$$

$$= 1,721.25 \text{ min}$$

$$= \frac{1,721.25 \text{ min}}{60 \text{ min/hr}}$$

$$= 28.69 \text{ rs}$$

2. First find the average flow per hour. Then find the number of hours till the overflow occurs.

$$\text{Hourly flow} = \frac{410,000 \text{ gal}}{24 \text{ hours}}$$

$$= 17,083.33 \text{ gallons per hour}$$

$$\text{Hours till overflow} = \frac{92,000 \text{ gal/hr}}{17,083.33 \text{ gal/hr}}$$

$$= 5.39 \text{ rs or 5 hrs 23 minutes}$$

3. The wet well at a lift station receives a flow of 345 gpm. The wet well has a diameter of 27 feet. How many minutes will it take to raise the water level seven feet in the wet well?

First calculate the volume of water it will take to fill seven feet of the wet well. Then determine based on the gallons per minute how long it will take to rise to a level of seven feet.

$$\text{Volume} = .785 \times 27 \text{ ft} \times 27 \text{ ft} \times 7 \text{ ft} = 4,005.86 \text{ ft}^3$$

$$4,005.86 \text{ ft}^3 \times 7.48 = 29,963.80 \text{ gal}$$

$$\text{Minutes to rise to 7 feet} = \frac{29,963.80 \text{ gal}}{345 \text{ gal/min}}$$

$$= 86.85 \text{ min}$$